

THE MOTOR AGE

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THE AUTOMOBILE ON THE TOW PATH

RECENT EXPERIMENTS IN EUROPE DEMONSTRATE THE FEASIBILITY OF TOWING CANAL BOATS WITH ELECTRIC AUTOMOBILES—TWO SYSTEMS DESCRIBED—SPEED AND HAULING ABILITY INCREASED, EXPENSE PER TON DECREASED—ADAPTABLE TO IRREGULAR TOW PATHS



NE more lap has been gained by the automobile over the horse in the race for precedence in commercial transportation. Another avenue long occupied almost solely by the plodding equine has been invaded. Once again has mechanical ingenuity robbed animal strength of importance. The electric horse is now seen on the canal tow path. The slowest and cheapest method of interior freight transportation is about to be made still cheaper and yet faster.

The propulsion of canal boats is a mat-

ter that has not been given the same attention conferred upon the railroad, the steamship and the road vehicle. There are a very few paddle-wheel steamboats and tugs in use for canal towing, but the majority of the work is done, as it has been done for centuries, by horses and even by men. The mean speed thus obtained has never exceeded one mile an hour.

The time has now arrived when we see that the development of the iron road and the waterway should go along side by side, each of them being more particularly adapted to the conveyance of certain kinds of merchandise, the first being the more rapid, the second the more

economical for imperishable freight.

It is necessary, however, to adopt self-propelled boats universally first of all to greatly transform the already existing canals, as the waterways are generally insufficient for the adoption of boats of great tonnage which alone can make the traffic remunerative.

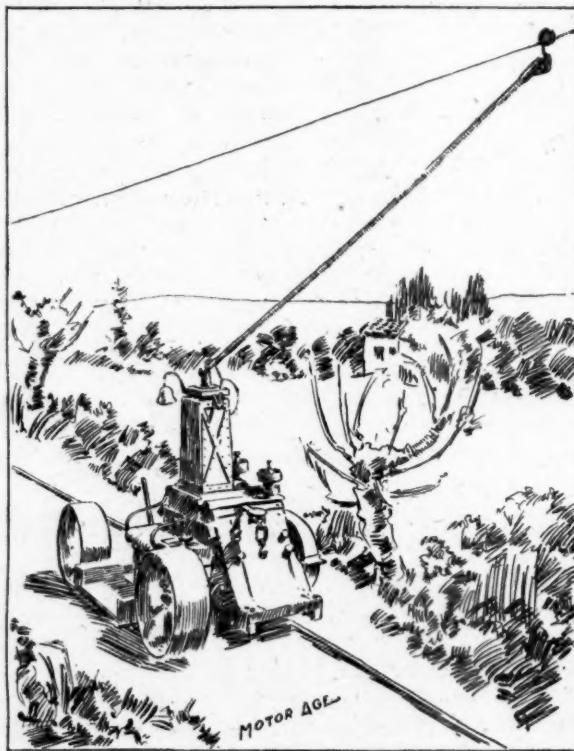
The great canal systems in each country lend themselves marvelously to a new rational application of steam and electric motors. The problem is to find the system of towage which is the most practicable.

M. Galliot, a French engineer, recommends employing an electric road engine which is to run on the tow path without rails and towing the boats by means of a cable the same as with horses. This conclusion seems perfectly justifiable considering the small dimensions of the canals. The carrying power of the steam tugs and other towing boats is greatly reduced by the cumbersome machinery lodged upon them and in addition the paddles and screws throw off waves which ultimately injure the bottoms and sides of the canals. The chains of the tugs resting upon the bottom of the waterway produce an effect even more disastrous.

The most satisfactory results have been obtained from an electric locomotive of medium power moving on one or two rails.

Two systems of tow-

ing differing widely from each other have been tried on the Finow canal in France, one that of an American, Lamb, and the other under the direction of M. Koettgen of Berlin. The loads towed consisted of a number of boats of 150, 170, and 350 tons. The portion of the canal decided upon contained the most characteristic difficulties of interior transportation, such as sharp turns, passing bridges and wharves. The electric tractor of the Lamb system consists essentially of an automobile moving on cables. Strong posts of wood or iron are erected along the outside of the tow path and support two very strong cables. They are respectively three-fifths and one and one-quarter inches in diameter and are placed in the same vertical plane. The motor is suspended by a grooved pulley which runs on the upper cable. The motor sets in action a windlass over the drum of which rolls the lower cable. The weight of the whole machine is 1,980 pounds and it has five horse power. The speed attained is about two miles an hour. The posts must be anchored very strongly at the turns in the canal as the strain is very great. One of the principal objections against this system is the great resistances the carrying and tracking cables must sustain. It is feared that frequent repairing of the cable will be necessary. Then again the height of



THE KOETTGEN ELECTRIC TOWING LOCOMOTIVE.

above the ground makes it difficult to make repairs.

However, this system has the very great advantage of not obstructing the tow path. Besides, when a barge in tow passes empty barges moored at the bank, passage is easily made, the towing cable passing about ten feet above the stationary boats. The experiments made have been more particularly favorable to the Koettgen system. In this an electric locomotive is used. It runs along the bank towing the barges with a cable and moves on two rails if the tow path is used but little or on a single rail placed preferably on the outside of the path so as not to obstruct the bank. On the side toward the water two wheels with wide rims roll directly on the ground. The electric current used in these experiments was 500 volts. It was conveyed to the engine by overhead conductor with a pole trolley. The locomotive is sixteen horse power and weighs two tons. The towing cable is attached to the engine about one yard above the ground. On the barge it is fastened to the end of a pole fifteen or twenty feet high. To avoid high obstacles, a second hook has been placed on the engine six feet above the ground.



Electric Auto Towing Canal Boat.

The conductor of the engine sits on a seat facing the water. From this position he can see his own convoy and the ones coming from the opposite direction. At his left hand is the starting and regulating apparatus and at his right the mechanical brake. As the de-

clevities on tow paths are usually extremely gentle this latter is used but rarely. There is a bell at the right so that he may communicate with the boat man by the customary methods. The rate of speed being relatively slow, two to two and one-half miles an hour, the conductor can leave the engine while it is moving.

With the Koettgen system the passing of convoys is easily made. If there are paths on both sides of the canal the locomotives come and go between terminal stations fifteen or twenty miles apart. If there is but a single path, as is generally the case, the locomotives run in relays of one to three miles, quickly changing their cables and convoys when they meet. They tow three full barges of 350 tons or two barges full and two barges empty. The locomotives are perfectly stable and remain on the track even when the rails are covered with snow or rain.

SAY THEY ARE IMMACULATE PROMOTERS

New York, Feb. 10.—In order to learn what the promoters of the much-talked-of Anglo-American Rapid Vehicle Co. have to say concerning their organization, a Motor Age representative called upon Vice-President Francis D. Carley and Sales Manager Henry Crowther, whose headquarters are at 20 Broad street, this city. They received the Mo-

tor Age man today cordially and answered his questions courteously.

"The Anglo-American Rapid Vehicle Co.," said Mr. Crowther, "was incorporated in Delaware last November with a capital of \$75,000,000. The capital is all paid up and is partly in cash and partly in stock, which is not for sale but is held in trust for at least two years. It is a

legitimate manufacturing enterprise and not a stock jobbing scheme. It embraces abroad the British Motor Co., the British Motor Coupe Co., the Coventry Motor Co., the Pennington Motor Co., the Pennington Foreign Plant Syndicate, Ltd., and in this country the Motor Cycle Company of America. We are now in negotiation with about twenty factories in this country for the manufacture of our motors and motor vehicles, which will be of every kind, from the largest omnibus to the smallest tricycle.

"W. W. Gibbs of Philadelphia, the president of the company, started the Electric Vehicle Co., but became convinced that gasoline and not electricity was the motor power of the future and so started this company. With him are associated some big Philadelphia capitalists, whose names I cannot now divulge to you. There has been some knocking of the company in England by some of the trade journals, but this comes largely from their jealousy of Mr. Lawson as a promoter and their personal enmity toward him. Some of the English trade journals are against us and some with us.

"We expect to conclude most of our deals with the factories by the middle of next week. We will also open next week our magnificent show room at Fifth Avenue and Twenty-seventh Street, where we will show a full line of our vehicles. They are merely samples from abroad, however, and will not be for sale. Mr. Trebert of the Olive Wheel Co. and Mr. Vanarsdale of Racine, Wis., are with us."

"I will leave Wall Street to-day," said Mr. Carley, "and to-morrow all the great dailies of the country will contain our financial prospectus. Our company stands on its own merits. We are not responsible for anything that may be charged against Mr. Lawson or Mr. Pennington. We bought their patents and gave them cash for them and they are stockholders, of course, and whatever may be thought of them will not affect the value of the patents we have bought. In ninety days we will turn out and sell more motor vehicles than all the other companies in the world combined. We have orders for thousands for

shipment abroad. Our foreign companies cannot supply five per cent of the demand.

"We control the Daimler and De Dion patents for Great Britain and may fit these motors to many of the vehicles we export, but for American trade we will put in our own special gasoline motors. We are now building four racing machines to compete in the great foreign automobile contests on the road, which will show speed hitherto never approached by any vehicle. We ask the public and the trade to withhold their criticism of us until we have a chance to show them what we are going to do."

If the assertions of the above quoted gentlemen are borne out in practice then we will have had in America the highest example of \$75,000,000-probity that ever entered the stock market. However, before one blesses the chaste commercial intentions and purposes of men who wear pleasant smiles and courteously assure the dear American public that they represent the epitome of all honesty coupled with such marvelous business sagacity that they will be enabled in a few short months and by simple manufacturing methods to knock the rest of the motor vehicle industry into a cocked-hat, one must stop long enough to remember that some of these same men are fresh from the task of juggling with the pocketbooks of English investors in the most vivacious manner conceivable by others than the unsurpassable Mr. Hooley. People of cautious mind and who have watched the marvelous gyrations cut amongst European small investors by Messrs. Lawson and Pennington may not be able to appreciate the depth of truth in the assertions of the Rapid Vehicle people's statements. But then such doubting ones while conscientious in their doubts may never have had a promoter's training in telling the truth and so become unable to appreciate it at first sight.

The record of the Lawson and Pennington companies in Great Britain is a record of promotion, share selling, order taking and non-payment of dividends and non-fulfillment of orders. The few machines which have been turned out in the past have been, to all reports, poorly suited for the work for which they were

intended and sold. Mr. Pennington has thrashed through a series of mechanical bubbles in America and Europe and to-day none of his marvelous pretensions have merited the labor expended in telling about them. Their promotion has been in every instance a matter of gilded allurement. When the Pennington motorcycle was being fostered in England a prospectus of the promoters contained a large illustration showing Mr. Pennington mounted on one of his marvelous machines in the act of jumping a stream of water apparently some twenty to thirty feet wide. This is an example of the men and their methods. None of the commercial or trade papers of England have a good word to say for the methods or doings of either man. Those who have dealt with them have lost. The loss may be charged to what it may, but the fact still remains that it is not good reasoning to suppose that much good can come from an institution based upon the purchase of the interests, good will and co-operation of Messrs. Lawson and Pennington.

The patents which the Anglo-American company state they have purchased are in some instances, but not many, valuable across the Atlantic. They are not needed or particularly useful in developing the motor vehicle industry in this country.

While to a certain extent irrelevant to the subject it is timely knowledge that Mr. Pennington is supplementing previous adventures in the land of the

moneyed gullible by preparing for the promotion of a flying machine company in this country.

A fact which so far seems to have escaped the attention of the press is that the company has been in correspondence with a number of bicycle manufacturers with a view to obtaining estimates on the production of vehicles. This is the only indication so far noted of a desire to transact a legitimate business and may or may not be designed for use in connection with the coming prospectus.

During the recent show a number of manufacturers called upon these people but few of them came away with a favorable impression. The statement made to them was that they were expected to bid on 100 vehicles or parts of vehicles to be made from drawings furnished by the company with the understanding that if the work proved acceptable they were to bid, later on, for 1,000. One manufacturer desired to take the drawings with him to his factory for the purpose of having competent men figure on the work, but his request was denied.

Two or three months ago a report reached Motor Age that a syndicate of English and American capitalists were negotiating with the American Bicycle Co. for the manufacture of a tremendous number of vehicles and that that company was tolerably sure of securing the order. There is reason to believe that the parties are identical. There is no evidence to show that the A. B. C. is making extraordinary efforts to secure the business.

*The automobile is a paradox
With its merry gear wheels humming,
For without a question, quibble or doubt
As sure as it goes, it's coming.*

TOLD AT AN AUTOMOBILE CLUB



THE Chief Story Teller of the Progress City Automobile Club indulged in a yawn, pulled a long black stogie from a pocket in his plaid waist-coat, walked leisurely over to the ignition tube that hung above the smoking table and having effected his purpose carried a tank of story telling fuel back with him to his long leather chair.

It was a significant pointer to the assembled automobilists that he was tired of the discussion concerning carburetors. It was well known among the members that his capacity for the absorption of technical facts and learning was limited. His accumulator was easily charged in an hour. Then he was always ready to force an adjournment of technical debate. It had been often said of him that it mattered not how highly he was charged with fact his mental storage battery was sure to give forth fiction. The only assertion that he had ever been known to make in a mechanical way was that he had no use for electrical "autos." He never took the pains to tell why. He operated a steam wagon himself and there are some who assert that he was compelled to get the entire board of examining engineers close to the verge of "drunk and disorderly" in order to secure a steam engineer's license. He proudly claimed that he was no machine shop tinker—he was an automobile sportsman.

The carburetor conversation stopped. Experience had taught that it was better to take a hint than one of the Chief Story Teller's tirades against amateur learning. Being assured of the willing assent of his audience he began:

"Some of you fellows have been wondering why Jack Briggs and Howard Thomas don't come around to the club

any more. I found out yesterday and thereby hangs a tale.

"You remember before Briggs bought his steam runabout both he and Thomas were cranks on electric wagons and both were cranks concerning the virtues and loveliness of the same girl, Janet Balbridge. You know her, don't you? Well, Jack and Howard were friendly enough to all appearances, but still each of them was perfectly willing to gain a lap on the other in the race for the girl. Most of the time Howard was ahead.

"The real trouble started the time Briggs loaned his electric trap to Thomas to take a run down to Painesville. The other electric was out of order. Thomas was scheduled to bring the wagon around to the Balbridge mansionette on Norwood place the following Sunday afternoon as Briggs would be there calling on the girl and had promised to take her out for a ride.

"Howard took the trap around there all right, but before he did so he spent about an hour fooling with the wires in the works. You see he knows considerable about electricity and motors and such things and he had figured out how to have a little fun with Briggs that might be to his own advantage concerning the girl. He changed the wires running to the rheostat—I think that's what you call it—and fixed it so the machine worked the other way from the usual way. The wagon was one of those with only one rheostat 'handle' and you drove it forward by pushing the handle one way and backward by pushing it the other. So after Howard got through with his tinkering the wagon would run backward when you pushed the handle to make it go ahead. Then he fixed the steering gear so that he could readily lock the front wheels at an angle. Keeping in mind the reversed scheme he had carried out, he ran the trap down to Norwood place. He brought it up to the curb in good position for Jack and the

fair Janet to get in, having turned the front wheels out toward the street just far enough for him to slip his improvised locking rig into place. He ran up the steps to the house, left word that the trap was ready for the couple and then sauntered down the street in search of a place from which he could look without being looked at.

"Jack and Miss Balbridge were not long in coming out and getting into the carriage. Jack pushed the handle to make it run out ahead into the street. Then the fun began. The trap backed out from the curb and started to run a race with itself around a circle about thirty feet across. Jack looked at the lever. He had pushed it the right way sure enough and he began to wonder in a hurry what the matter was. The proposition rattled him and instead of stopping the trap altogether he kept on pushing the handle in the direction he thought was right to run the wagon

forward. He soon had the thing going around backward at full back speed. The case looked bad to him. He then discovered that the steering gear was locked and completely lost his head. Unmindful of the exclamations and hurriedly anxious queries of his fair companion, he jumped. After he had stood among the quickly gathered crowd of advising and cheerful spectators for about five minutes watching the scared Janet circling around backward in a \$1,500 electric trap and just clearing the curb every lap, he collected his thoughts sufficiently to tell her to push the rheo-

stat lever back to the full stop point. After a little timid investigation of the affair she did this and Mr. Runaway stopped.

"There isn't much more to that part of the story except that Jack found himself hopelessly out of the race for the daughter of the house of Balbridge. He figured it out that Thomas was the cause of it all, but he could not prove it, and then, too, he remembered very vividly that he had jumped and left the lady in full charge of the runaway.

"The sequel came about a month later and in this instance also Thomas got the best of the deal. It seems that though

he became to be fairly successful in juggling with the affections of the girl he was never able to get around to the sunny side of the old man's feelings in the matter. So in true romantic style it became necessary in order that love might flourish to effect a modern-day elopement in an electric



carriage. The flight occurred last Monday evening. The two of them had been to the theater and a little supper afterward and when they stepped into Howard's electric trap it was not home they went. A hastily packed suit case and some bundles had been stowed in the trap earlier in the evening and the electric was turned off of the boulevard into the Stover Center pike. The plan was to go to Stover Center and from there to Lawrence, which, being the county seat, would furnish the necessities in the way of license, etc., for a hurried marriage.

"The trip on the country road was a

fine one as far as Snake Hill. The road was level and smooth and that electric trap can go some when it is in good shape. Thomas was congratulating himself and his prospective bride upon the success they were enjoying just as they started up the hill.

"But as the wagon began the ascent it seemed to weaken. It was running at slow speed but even then it was apparently not going as fast as it should, and as the climb progressed it persistently and surely slowed down until just within a few yards of the top it stopped entirely, hesitated a moment and then began to run backward of its own weight down the hill. Its owner was perplexed and set the brake to stop it. Then he tried to start it up hill again but it would not go. So he let it back down to the bottom and ran it off to the side of the road. He knew what was the matter. He had forgotten to have the storage battery recharged that evening before starting. The batteries had worn out entirely. There was no more electricity and no more electric transit that night. He told the girl about it and as there was no present help for the matter they were forced to take up their luggage and walk. They haven't said much about that walk but I guess they learned well enough that walking is a far different proposition from automobile riding on a crisp winter night before they had covered the eight miles to Stover Center.

"In the meantime the paternal Balbridge was on the trail. A waiter at the hotel where the eloping pair had eaten supper had overheard them discussing their plans and made mention of it to Briggs, who happened around a little later for a stag supper with some friends. The latter lost no time in getting out into his new steam runabout and driving down to Norwood place where he pulled the old man out of bed and tipped him off about the elopement. The latter was furious for a minute or two and was on the point of ordering a cab when Jack interposed on the ground that no horse drawn vehicle could overtake an electric. 'I have a steam runabout which can go thirty miles an hour, though,' he added. The hint was taken and it was not many

minutes before the two were scurrying along the Stover Center pike.

"At Snake Hill they saw the abandoned electric and were momentarily in doubt as to the route of the runaways. Tell-tale tracks in the snow put them on the scent again, however, and with confidence renewed they hurried on toward Stover Center. In fact, they were too confident. They neglected to watch snow tracks, for as they neared the outskirts of the village they were detected by a weary pair who quickly dodged behind a clump of brush and were passed unseen.

"While the advent of the steam wagon with father and rival was a new item in the deal Thomas was hardly perturbed, for his quick wit saw a splendid chance, not only of successful escape but to enact a corkingly original coup d'etat. He whispered to the shivering Janet for a second and then set the pace rather briskly in pursuit of the steam wagon just disappearing in the gray morning light. When they arrived in front of the sole tavern of the village they saw, as expected, a steam runabout in front. Thomas deposited his suit case and the other luggage in the vehicle, handed the lady up to a seat, climbed in and had just got the wagon nicely started when a disappointed couple appeared in the doorway of the hotel. Thomas threw an exasperating laugh over his shoulder at the now enraged and outwitted pair and quickly running the speed changing gear up to the twenty-mile-an-hour point was off for the county seat.

"There was no alternative of any kind in sight for Briggs and old man Balbridge, so they hired a team and started for home. At Snake Hill they again passed the deserted electric and thinking that they might as well get something out of their journey, hitched it on behind their carriage and slowly pulled it back to town.

"Thomas and his wife came back Thursday and successfully sued for peace at the Balbridge home. The old man after getting over his angry spell recognized the humor of the situation and the cool nerve of Thomas and was easily pacified. It was different with Briggs, however. When Thomas went around

to change vehicles he ran the steam carriage into the stable but was forbidden by Jack to run the electric out. Briggs told him that he had found the electric trap without an owner on a country road and that he intended to keep it and that furthermore if Thomas attempted any legal proceedings to get it he would be arrested for stealing a steam carriage at Stover Center. Neither has been at the

club yet for fear he will be forced to meet the other. Thomas told me to-day that he had a little scheme in his head for getting ahold of his electric. In the meantime he is riding on street cars."

The Chief Story Teller, feeling that he had done his duty for that evening, drained his fuel tank to its last drop, ignited another stogie and sauntered off to his bachelor quarters above.

ORIGINALITY IN BALDWIN STEAM VEHICLES

Providence, R. I., Feb. 10.—The Baldwin Automobile Co. of this city, preparatory to manufacturing its steam vehicles on a commercial scale, has recently purchased the machinery of the defunct Relay Mfg. Co. of Reading, Pa. It has not yet, however, decided upon a factory location, but as soon as this is decided is prepared to go ahead with the manufacture of the vehicle on a large scale.

The frontispiece of this issue shows a Baldwin trap recently completed in the shop which the company has devoted to building experimental vehicles. This vehicle is provided with a movable seat, not shown in the illustration, by the use of which it may be converted into a dos-a-dos. There was seen by a representative of this paper a piano-box runabout in process of construction, with body constructed of angle iron covered with aluminum, making the vehicle very light and natty in appearance. It is similar to the one recently illustrated in Motor Age.

Superintendent M. L. E. Baldwin has spent his entire time for the past several years in automobile study and experiments and shows by his work and his conversation that he has a far better grasp of the problem involved than many of the people who are attempting to put automobiles on the market. He spent considerable time in building gasoline engines for use in vehicles, and despite the fact that he has had successful ve-

hicles of this description on the road, now pins his faith to steam as a motive power.

In the construction of his vehicles he has not followed the practice of many of the builders and experimenters in this part of the country, viz., that of imitating the Stanley boiler and engine, but has made use of many meritorious ideas of his own, which naturally are covered by patents.

In his running-gear construction he has recognized and provided for the varying stresses to which the running gear of a motor vehicle is subjected. The frame is steel tubing with forged connections and has provision for permitting the wheels to accommodate themselves to the inequalities of the road without strain to the vehicle and without permitting the distance between the front and rear wheels to vary. The general shape of the Baldwin trap can readily be seen by referring to the frontispiece, which shows Mr. Baldwin driving the vehicle with his left hand on the telescoping steering lever and the right on the throttle. At his feet is a foot-lever actuating simultaneously the two band brakes at either side of the rear axle. Steam and water gauges are in view by the driver from his seat without moving. The water gauge is carefully protected against breakage, being set in a stout metal frame.

The power is transmitted from the

driving shaft by means of sprocket wheels and chain, the sprocket wheel on the rear axle surrounding the differential gear. The rear axle is made, to telescope, to give it the necessary strength and rigidity, one side being larger than the other. The steering is accomplished through the front wheels in the usual manner, the wheels being set on stub axles. The upright part of the steering lever is provided with a universal joint to allow of the action of the springs without conveying undue vibration to the driver's hand.

Both front and rear wheels are substantially made and are of the suspension variety. One very noticeable feature is the extra wide hubs with which they are provided, for the purpose of insuring sufficient strength to withstand the severe transverse stresses to which the wheels of motor vehicles are subjected. This feature of wide hubs is one to which few of the makers of self-propelled carriages have given the attention which it apparently merits.

The boiler used is of the upright fire tube type. The fuel is either gasoline or kerosene, the former preferred for reasons which will be shown later. To start the engine a hand pump is used to pump air into the gasoline tank to give the requisite feed pressure to the burner. A small receptacle is filled with wood alcohol (gasoline may be used) and after being lighted is set under the burner to give it the necessary initial heat to vaporize the gasoline. The burners are lighted from this by the turning of a cock and after a brief time to get up steam the vehicle is ready to operate.

Once started it requires no further attention beyond that required to see that the fuel and water supplies are not exhausted. The steam pressure regulates automatically by means of a diaphragm valve the supply of fuel. In case the vehicle is left standing the supply of gasoline is cut off from one or two of the three burners as the steam pressure rises, and the third supplies merely enough heat to enable the vehicle to be started again at a moment's notice. The vehicle may be left a few minutes or hours without danger, with no consump-

tion of water and only a very small consumption of fuel.

The engine is of the two-cylinder double-acting vertical variety. It is very carefully constructed and exceedingly light, and at the same time strong. The cylinders (2½-inch bore and 4½-inch stroke) are set on the circumference of a circle struck from the center of the boiler and lie snug up against the latter, while the steam chest is located at an angle between the two cylinders, making a very compact arrangement. The clearance is small in the cylinder heads, the steam ports being wide but not deep. The exhaust ports are of ample size and open direct into a jacket surrounding the entire cylinder, giving at once an exhaust with little back pressure and a steam jacket for the cylinder.

The exhaust steam is carried from this steam jacket to the combined muffler and condenser and then passes through the fuel tank in the shape of hot water, maintaining a sufficient pressure in the tank (if the fuel be gasoline) to avoid the necessity of any hand pumping. Thence the hot water passes to the water cooler in the dash, which it will be noticed by reference to the illustration is composed of a number of horizontal tubes through each of which the water is compelled to pass before it is returned to the supply tank, to be again sent on its cycle of functions.

In case it is required to call upon the engine for an unusual amount of work, as in the case of continued hill climbing, or of traversing very bad roads, and there is a consumption of a greater amount of steam than the condenser is able to take care of, the necessary portion of steam is automatically shunted off into a tube which coils over the upper openings of the fire tubes of the boiler, is there superheated and passes below into the burner, where it meets a forced draft, after which it passes off with the products of combustion in the shape of an invisible exhaust, after having added to the steam producing power of the boiler.

The feed water is automatically pumped from the supply tank to the boiler, but a large hand pump is also provided in the

vehicle, to guard against delay owing to any accidents to the mechanism and for service initially.

The engine is, of course, reversible, but the reversing is accomplished by a unique device, the invention of Mr. Baldwin, without the use of the common link motion, to which Mr. Baldwin objects on the grounds of its insufficient wearing qualities.

The cut-off is normally fixed but may be varied by hand if desired.

All the bearing parts are made extra large to provide against undue wear in an engine that is made to work under particularly trying conditions, such as are found in motor-vehicle work. To avoid unnecessary weight these wearing parts are in many cases made hollow.

The president and treasurer of the Baldwin company is Horatio Fraser, a member of a large local jobbing house. Chester Campbell is secretary.

THE INDUSTRY IN EUROPE

The following letter from an European correspondent presents the condition of the motor vehicle industry today as viewed by a continental writer:

Frankfort, Germany, Feb. 2.—If one reads continental papers one wonders at the enormous advance Europe makes in using motors to propel their street conveyances, and if one reads American papers for a change one thinks that America is still the only country of progress where motor cars are used to an appreciable extent. But in judging the industry in Europe one must not take England as Europe. England is far behind the time with regard to the practical use of motor vehicles; it is in a developing stage and has still to go through all the infant illnesses and complaints of a large industry. How it will emerge from this evolution is not to be foreseen, as the present lookout is far from being pleasant and the progress made during the last two years is not much more than America's progress in a month. England, from one end to the other, cannot boast the possession of more than 500 motor carriages of all description in practical use.

France deserves still to be looked upon as the mother country of motor cars, although it has already lost much of the importance which it enjoyed till the last season. The country where motor cars found the readiest help for evolution and improvement deserves always to be gratefully remembered as long as motors exist for the great services it rendered the

industry. Nobody can deny that France has made great progress especially in light and elegant vehicles and motorcycles. The many large factories France possesses turn out today a large number of practical cycles and carriages, which have been ordered many months ago and every new order now booked is only accepted under the conditions that delivery is made as soon as comes the order's turn. Not only a few but all the French makers are busy and will be so for a long time to come, especially as the coming world's exhibition will certainly bring them a good lot of fresh orders, which will not only employ the workmen and factories, but also enhance the reputation of the country as the true motherland of all self-propelled vehicles.

It is quite in accordance with French sentiments and the national character only to build light vehicles, very graceful and suitable for enjoyment; but if these lines will pay in future is quite another question which France is not considering as long as it finds a ready market for its present styles. France is not the future home of motor making, that is quite sure. Germany will make a bold bid to get the European supremacy. As the United States will soon have cars to spare it will play its useful part in exporting such to Europe. This will prevent European makers from standing still and charging exorbitant prices for unimproved machines.

That Germany is not behindhand in se-

curing as large a market for its motor products as possible, everybody knows who studies its manufacture and is acquainted with its large resources of energy and invention. The pioneers of Germany, the Daimler and Benz cars, are still the only ones used to any extent at home and in England, and they have a lasting hold on both markets. A great advantage Germany has over all other European makers is that they started early making large transport vehicles for popular use, as this class will be the most needed vehicle of all, which will bring also the largest profits, as it must and can be produced in big quantities. German makers look askance at the steam and electric motors and pin their faith to the explosive engine.

The many motor omnibus lines opened during the last year in Germany prove

beyond doubt that there is not only a good market, but show furthermore the friendly spirit of municipalities which even grant subsidies to enterprising companies introducing such motor services into their towns. These grants are at least for a number of years until a paying service has been arranged. This is the spirit to meet the necessities of our time and to help a new industry to take a deep and lasting root as of important and national interest.

Austria and Italy have also fairly started making motor cycles and cars, but they are not of great importance beside Germany and France. Such smaller industries serve the good purpose of making motors popular and to bring them before the eyes of the public, where otherwise it would be a long time before they could be properly introduced.



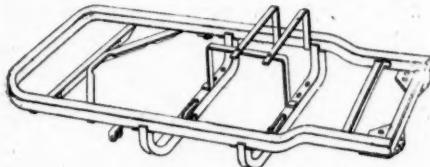
WHERE THEORY &
PROMISE PREVAILS

PROBLEMS WORKED OUT

HOW AN ENGLISH AUTOMOBILE MAKER CHANGED THE IGNITION SYSTEM ON HIS DAIMLER MOTOR FROM TUBE TO ELECTRIC—TWO MOTOR VEHICLE DESIGN PATENTS—A FEW MEDIOCRE PATENT OFFICE GLEANINGS

MOTOR VEHICLE FRAME

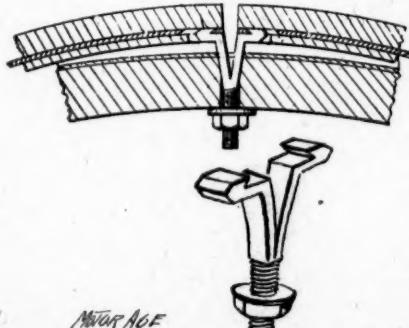
Design No. 32,199, to W. O. Worth of Chicago.—This frame design comprises the arrangement of square tube and U-iron as shown, its essential feature being



the oblong outline frame of tube and the over and under-hung cross pieces suitably located for supporting the motor and gearing.

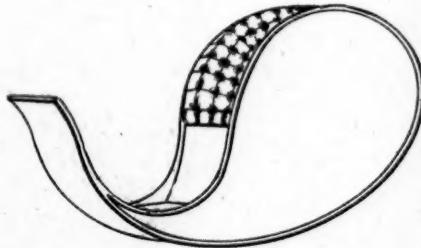
TIRE FASTENER PATENT

No. 642,938, to A. W. Warnock of Boston.—This invention comprises a metal base rubber vehicle tire in combination with a split draw bolt for tightening and securing it upon the rim. Sockets or elongated holes with inclined edges are



formed respectively in each end of the metal band or base of the tire. The binding bolt is split and its arms diverge. At

their extremities are shoulders or secondary arms, each of which bears an inclined or beveled edge boss which matches and engages the corresponding socket in the adjacent overlying end of the tire base. The bolt is seated in a radial hole through the wheel rim or felloe and when it is drawn downward by means of the binding nut the diverging arms are brought together and their shouldered heads forced toward each other and toward the rim simultaneously. The tire is thus contracted to fit the rim snugly and securely and the ends brought tightly together. The inventor makes no provision in his invention for any peculiar construction of tire and base, keep-



ing himself free to apply the draw bolt binder to various styles of this type of vehicle tire.

AUTOMOBILE BODY DESIGN

Design No. 32,198, to C. R. Harris of Williamsport, Pa.—Among the design patents issued last week was that shown in the accompanying illustration for a motor vehicle body. The body is of the style used on victorias and its distinctive feature is the outline of each side, this being a continuous unbroken curve. The edge of each side comprises a continuous tube bent around as shown and joined to

itself slightly below the end forming the upper corner of the dashboard.

OTHER RECENT PATENTS

Nos. 642,811 and 642,812, to Robert Cowen of Cambridge, Mass.—These patents are for solid rubber tires having sectional metal bases. The base being composed of a number of short independent parts vulcanized to the rubber tread and partly imbedded therein and interlocked loosely with each other by simple integral hooks and eyes, will readily conform to the curvature of the rim of any size wheel. Each base section is secured to the wheel felloe by a bolt.

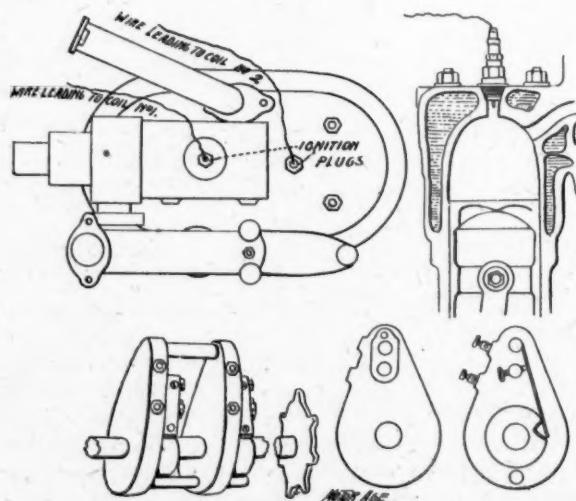
No. 643,031, to John Arn of Columbus, O.—The invention comprises a tire composed of two concentric flat metal bands between which are a series of elliptical springs. A rubber or other elastic shield drawn over the whole protects the springs and a flat rubber or rawhide tread is added to the outer metal band to make the tire noiseless. The inventor is but treading the unsuccessful footsteps of hundreds of others who have fostered the idea of tire elasticity being obtained by metal springs.

HOME-MADE IGNITION DEVICE

An English motor carriage operator says that in the use of a Daimler motor

he has had eminent success with the single exception that the tube ignition has always been a source of worry to him because of the noise and heat of the lamp and the risk of fire through upsets, leakage of joints, etc. Accordingly he concluded to rig up an electric ignition device on his engine. He was not willing to undertake structural alteration in doing so and was forced to give up the Benz system of electric ignition, after trial, on this account. The best he could successfully do was to ignite one cylinder with electricity and the other with a lamp. He next turned to the De Dion system and was successful.

The two plugs in the cylinder heads were removed, the holes enlarged and a pair of De Dion pattern ignition plugs fitted. A hole was cut through the air silencer and in it soft soldered a piece of one and one-half-inch brass tube to allow room for the left hand plug to be inserted or removed with a box spanner. The arrangement of the timing gear and fiber cam parts is shown in the accompanying illustrations. The cam shaft is revolved by a sprocket and a chain and is mounted on ball bearings. The fiber plates are six inches long, three and a half inches wide at the widest part and three-fourths-inch thick. They are bushed with metal collars. It is imperative that both these and the cams should be of vulcanized fiber



ELECTRIC IGNITION ON DAIMLER MOTOR

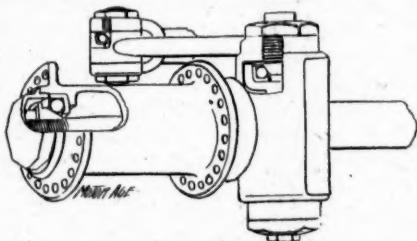
and not of metal. Two De Dion coils and two sets of batteries are used. A small steam tap valve is fitted underneath the lamps so that they can be extinguished

without letting off the pressure in the supply tank. This plan enables the use of the tube ignition should anything go wrong with the electric device.

CURRENT TRADE NEWS AND NOTES

MAKES HUBS AND STEERING KNUCKLES

The Layton Park Mfg. Co., 105 West Water street, Milwaukee, is prepared to furnish automobile builders with ball-bearing hubs for suspension wheels and also with steering wheel knuckles to be used in connection with these hubs. The

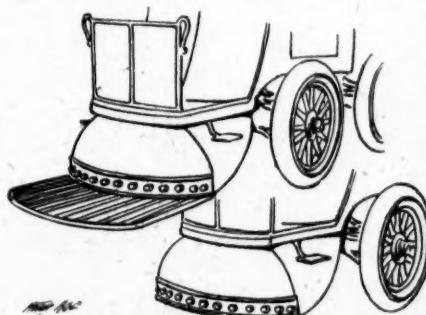


accompanying illustration shows such a combination. Both the vertical swivel bearing and the steering rod joint are ball-bearing and of simply, easily adjusted and locked construction. The hub axle is one inch with six-inch stub. The barrel diameter is two and a half inches and the distance between spoke flanges four inches. Three-eighths-inch balls are used in hub and one-quarter inch in steering knuckle. The horizontal steering level is made in one piece with the body of the vertical knuckle. A slightly heavier hub than this is also manufactured. The company is prepared to quote especially attractive prices on quantity orders. F. W. Huennekens Sons Co., same street address, Milwaukee, is selling agent for these goods.

IF FENDERS ARE NEEDED

There is talk now and again in certain cities of ordinances and provisions compelling the fitting of fenders to automobile cabs, and while it is hardly probable

that such an inconsistent move will be made by municipal authorities it is interesting at the time the matter is being discussed to notice various ways and means for equipping motor vehicles with fenders. Frederick J. Graf, 47 St. Mark's place, New York city, who is introducing a novel safety fender for street cars, has prepared his device especially for use on automobiles. This fender is distinctive from others in that it is not at all times projected in front of the vehicle, but is hung underneath, enclosed in a plain neat casing which does not lend unsightly appearance. When the motor man or driver of the vehicle sees a person about to be run over he presses a foot or hand latch, according to whichever has been chosen to operate the device, and the fender comes out with a force proportionate to the speed and momentum of the



car. The fender being hung in this manner is supported much closer to the ground than the ordinary fender and is thus not so liable to tip a person over and fall in picking him up without injury. It also possesses obvious advantages in the line of being out of the way except when in actual use. As soon as it has accomplished its purpose it may be

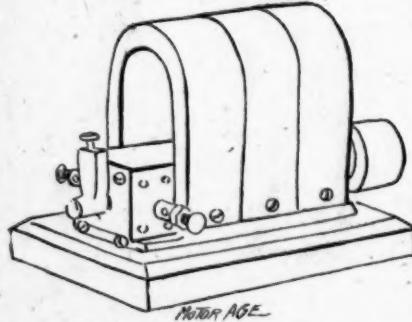
made to automatically run back under the car by simply operating the controlling latch or lever. The fender arms are covered with soft rubber, a thing which would be almost impossible in a fender at all times exposed. A further addition to the fender, if desired, comprises a row of safety cushion buttons along the front of the fender casing. Should the driver of the car fail to see the person liable to be struck quickly enough to project the fender, the unfortunate will himself operate the fender mechanism, causing it to run out under him by unconsciously striking one or more of these safety buttons across the front.

The Graf fender is not as yet in common use either on street cars or vehicles, but in the former field it will doubtless receive substantial endorsement before long. Its adaptation to motor vehicles depends almost entirely upon the outcome of the fender agitation. If motor vehicles are to be classed with street cars and unjust discrimination made concerning their highway rights, then the Graf fender stands a good chance of adoption because it has not the unsightly appearance and inconveniences of the cumbersome and awkwardly managed stationary fenders.



SPARKING MAGNETO

Builders of gasoline engine driven motor vehicles appreciate doubtless more than any other class of explosive engine users the advantages of the magneto for sparking purposes. Batteries are less of



an inconvenience in a stationary engine room than on a motor carriage and hence the desirability of the magneto is not felt so strongly in the former connection.

Those vehicle builders who are using magnetos for igniting their combustion cylinders endorse it thoroughly.

Giddings & Stevens of Rockford, Ill., who are experienced and widely known gasoline engine designers, have brought out a magneto for operating engine igniters which is said to possess distinctive merit and reliability, it having been well tested during the past three years. The makers say that it is dust and moisture proof, is self lubricating, and will run for three months without attention. It is guaranteed for one year. In speaking of the magneto Mr. Giddings says: "Such a device is by far the simplest and most reliable apparatus ever produced for igniting gas or gasoline engines. No batteries are required for starting, and hence there are no batteries to get out of order or to require replenishing. There is no spark coil used and there is no heating or short circuiting. In short, a magneto saves time, bother and expense."

The Giddings magneto may be driven by either a flat or round belt. Its exterior appearance is shown herewith.



SWEDEN SLOW TO RESPOND

It is strange that so progressive a country as Sweden has not yet adopted the motor vehicle to a larger extent. The Swede is generally on the alert to find something new and practical for his own use, but in this case he remains impulsive and does not seem to take to this innovation, avers the Cycle Trader of London. The bicycle, shortly after its introduction in Sweden, found crowds of admirers and buyers, but only three motor cars are to be seen in the two largest towns—Gotenburg and Stockholm. The two vehicles in the former town are of French manufacture, and the one in the latter place is an American.

What is the reason for the adversity of Sweden towards motor cars is a question which everybody must ask who is interested in the industry. The answer may be given that the Swede wants such a standard of perfection in a motor car as cannot yet be guaranteed. The exterior of the cars, their durability, easy handling, and prices, do not give satisfaction, as could clearly be seen when a

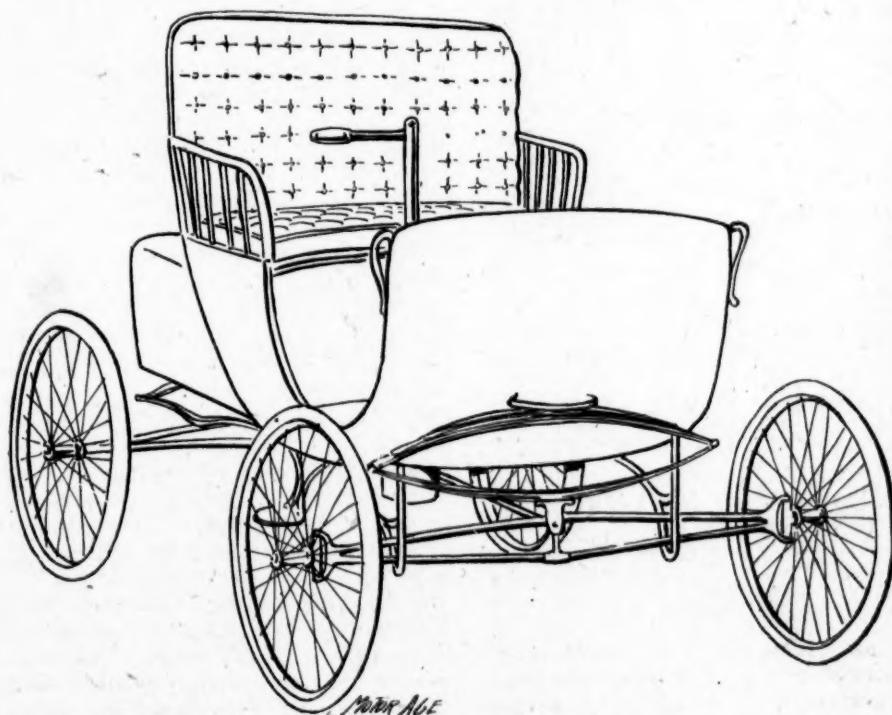
number of delegates of the Stockholm cab drivers visited the Mid-European Motor Exhibition, held last October in Berlin, to study the motor problem from a practical point of view. Their criticism was an object lesson to the engineers as to how motor cars, to be used in Sweden, must be constructed. On the electric cars they criticised the placing of the motor between the back wheels, the impossibility of starting quickly and the inefficient working of the steering lever on the front wheels, which does not allow of short turnings being taken, such as is absolutely necessary in a town like Stockholm with all its narrow streets, being to their minds greatly against its introduction. As all the larger electrical vehicles are of an enormous weight, they can hardly be used on the Swedish roads, where they cut too deep into the sand, and, thereby, waste too much power.

The lighter vehicles found universal admiration amongst the delegates, but they are not so much wanted as four-wheelers for two and four passengers, besides the driver, to supersede the car-

riages drawn by horses which are now in use. The electrical motor vehicle will have a great future in Sweden, which ought to be noted by those manufacturers who want to secure the country's business. Like the Americans, the Swedes have large resources of natural power to produce cheap electricity. The American Niagara is represented by the Swedish Trolhatton falls, where a central station for generation of electrical power will be erected, and the current carried over a large part of the country. Gotenburg, Lund, Bjerroed and Fankoping will soon have electrical tram services in connection with this central station, and an electric taxameter cab, or four-wheeler, will be likely to supersede the old horse drawn vehicles.

PORTR STEAM STANHOPE

The Porter Motor Co. of Boston, whose steam stanhope is presented in the annexed illustration, has not adopted a motor and boiler of standard construction but has developed an apparatus of its



PORTR MOTOR CO.'S STEAM CARRIAGE.

own. One of the members of the firm has long been engaged in building steam engines and he has applied his practical knowledge in this direction to the building of the Porter automobile engine and boiler. The boiler is fourteen inches square and sixteen inches high. It is of the water tube variety with 500 horizontal half-inch copper tubes. The boiler is divided into three compartments to afford the required circulation. The steam drum and separator are combined. The fuel is controlled by a diaphragm connected with a valve in the supply pipe. Both the water supply regulator and the burner are of special construction. The boiler is said to furnish sufficient steam for an eight horse-power engine.

The carriage body, which has seating room for two, is metallic, being constructed of an aluminum alloy. The entire weight of the vehicle is 550 pounds. The Porter company claims that in every respect the driving gear is perfectly safe under the control of inexperienced persons and that as the mechanism is controlled by but one lever there is no danger of complication of ideas in driving the carriage.

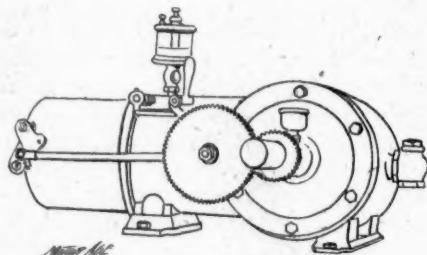
LAMPS OF ALL STYLES

Gray & Davis, Amesbury, Mass., offer the automobile trade a large assortment in styles of carriage lamps. These are made in patterns to suit especially well different types of automobiles—runabouts, traps, stanhopes, victorias, hansom, etc., and are also made in various grade and finishes to allow selection on a price basis. The company includes in the line an acetylene lamp with regulation square body.

NIAGARA MOTORS

The motor department of the Noye Mfg. Co. of Buffalo has added to its product gasoline motors for automobiles. The company has for some time been manufacturing vertical marine engines. Its new automobile engine is shown in the

annexed illustration. The two and a half horse-power size with single cylinder weighs 142 pounds, with range of revolutions from 200 to 600. The same engine is also built five horse-power



double, three and a half horse-power single and seven horse-power double. They are built in quantities and carried in stock for prompt shipment.

STEAM WAGONS IN CANADA

The National Cycle & Automobile Co. of Canada announces that it is now ready to take orders for its steam automobile. This vehicle is of the light runabout type, weighing about 450 pounds, though it is made in different sizes varying in price. They will be built in Syracuse, N. Y., this company being connected with the A. B. C. and the vehicles being made under patents now controlled by the latter company.

WILL DO THE MAKING

Up to the present time inventors of motors and parts for automobiles have had great difficulty in finding machinists who could promptly and satisfactorily carry out their ideas. It will therefore be good news to the trade to learn that the Avery & Jenness Co., 28 West Washington street, Chicago, is making a specialty of just this kind of work. The company is fully equipped to reduce new inventions to practical and commercial form, and also for making special tools or apparatus to accomplish certain specified purposes.

GENERAL NEWS AND COMMENT

AMERICAN AUTOS IN FRENCH CONTESTS

New York, Feb. 10.—Henri Fournier, the French motor cycle racer, who has been in this country since October, 1898, sailed today on the *Lucania*. He goes abroad in the interest of the Waltham Mfg. Co. of Waltham, Mass., to ride its various types of motor cycles and automobiles in the big races on track and road the coming season; for this company has determined to be the first American maker to beard the foreign lion in its own den at its own game. Fournier will be equipped with a complete racing outfit of single and tandem motor cycles, motor tricycles and quadricycles, and racing automobiles, and will be ready to accept challenges for match races and enter also in all the big open races.

Fournier was the first one to ride a racing motor machine in this country. His exhibitions on it at Madison Square Garden in December, 1898, started the motor racing and motor pacing game now so popular here. The following January he paced Jimmy Michael in exhibitions at San Francisco and rode against time at San Jose. In the spring he signed a two years contract to ride motor cycles and automobiles for the Waltham company, and in this capacity was the chief motor pacemaker for Elkes in all his big matches and world and American record trials.

His first open race will be the great one for \$2,000 from Nice to Marseilles and back, a distance of about 400 miles, promoted by the Automobile Club of France. In this race, as, in fact, in all the great automobile races abroad, there is no restriction as to kind of motor machine eligible, motor cycles being admitted as freely as automobiles. The Pau-Biarritz-Pau race will follow in April and then will come the Paris-Bordeaux-Paris race in May.

Fournier has competed in several of these big motor vehicle contests, notably the Paris-Amsterdam contest won by

Charron in the spring of 1898. There were 212 starters, of whom 180 finished.

"You can form no idea of the excitement of these motor vehicle road races," said Fournier to a Motor Age man. "The vehicles are started in a single line, generally a minute apart, the order of finish being determined by the times made. At every crossing and town and at the approach to any town there are big signs of instructions erected, danger signals shown and lookouts posted with bugles to clear the road, so that the motor rider tears ahead at from forty to forty-five miles an hour without slackening speed. He must, however, be not only a fearless rider but a good mechanic, prepared at any time to locate any trouble with his machine at once and to effect a repair with the least possible delay."

Mr. Metz of the Waltham company will go over in May.



COVER ILLUSTRATION

The tricycle shown on the front cover of this issue of Motor Age is one of a lot shipped to South Africa by the Motor Mfg. Co. of England for use by British army officers for dispatch carrying. The machines were consigned privately to the individuals to use them. They are the company's ordinary motor tricycles and are not fitted with spare fuel tanks. The customers, who are expert automobilists, would not have ordered the machines in this manner were it not possible to obtain plenty of gasoline at the base of operations.



NEW YORKERS ENTHUSIASTIC

New York, Feb. 8.—Interest in automobilism seems to be universally permeating. Every line written and every lecture delivered on the subject is received with eager attention. Even organizations not specifically devoted to the new locomotion are taking it up and furnishing information to their members. For in-

stance, Harold H. Eames, general manager of the Columbia Electric Vehicle Co., has been secured to lecture on "Electric and Gasoline Automobiles" in the theater of the Knickerbocker Athletic Club on March 22nd. Following the lecture gasoline and electric vehicles will be exhibited in the club gymnasium.

1,000 MILES ON AUTOMOBILES

London, Feb. 7.—It is now settled that the Automobile Club thousand mile trial is to take place from April 23 to May 12. It is probable that from thirty-five to fifty motor vehicles will take part in the trial. The distances to be traversed daily vary from eighty to 124 miles.

The committee of the Automobile Club of Great Britain, by whom the trial is being organized, are very anxious that the route should be properly marked throughout at corners or points where there might be any difficulty, with flags indicating the proper direction, and the committee invites the co-operation of cycle clubs, individual cyclists, and others who may be interested in this sporting event, who reside on or near the route of the trial, and who might be willing to assist in its organization by placing flags as signals or by acting as time-keepers.

TWISTING THE ARGUMENT

Many trade and class papers seem to delight in showing their readers by plausible argument that the automobile is bound to have a hard fight before it becomes widely adopted. This is the way the Farm Implement News tackles the subject:

"There is much truth in the statement that 'the horseless age must be preceded by the asphalt age, and the asphalt age must be preceded by the tax-paying age; therefore the horseless age will be a long time coming.' It is certain that roads must be made very much better before automobiles, carrying their own power and depending upon traction, can come into common use; and the unwillingness of people to be taxed to build even passably good roads indicates that horses will have to continue hauling over rough

roads and through the mud for an indefinite period."

It is true that the automobile is creating a demand for good roads. So also has the bicycle. It is not correct to reason, however, that the advent of the horseless carriage must wait upon the development of road building. The introduction of the bicycle and the automobile is rushing the good roads movement, putting life into it, making it a reality. Rather than say that bad roads will hinder the coming of the horseless age, say that the coming of the automobile will hurry good roads.

MOTOR FIRE ENGINES GAINING FAVOR

Philadelphia, Feb. 12.—During the coming week Director English, of the department of public safety, will visit Boston for the purpose of inspecting the horseless fire engines used by that municipality. It is the director's intention to obtain all the information possible concerning the practical working of this modern fire-fighting appliance to enable him to embody the same whenever feasible in the system at present in vogue here. The director will also endeavor to get an idea of the workings in actual service of the searchlight used by the Boston fire department to penetrate the thick smoke that usually hangs about a burning building.

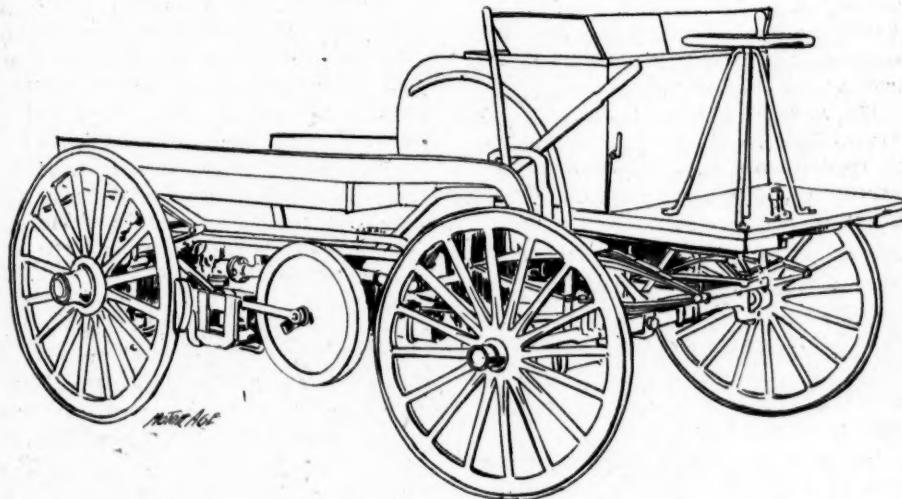
WHERE THE AUTOMOBILE IS NOT

While the bicycle and motor vehicle are making much amazing headway in this country and in Europe, the original unicycle—the wheelbarrow—more than holds its own in the Chinese Empire, where it is used for a variety of purposes to which it is especially adapted by Mongolian muscle and patience. This primitive application of the wheel to purposes of every day service is yet one of the chief means of transport among the Chinese, particularly in the northern part of the Kingdom and throughout the great plain.

This is not the wheelbarrow as we know it, but in point of fact a decided improvement on the types used in Europe and the United States, for it is so con-

structed that the load, which is sometimes very great in bulk and weight, is carried over the wheel, instead of as usual with us, between the wheel and the man propelling it. To aid in steadyng and propeling it, the wheelbarrow man wears across his shoulders a strap which is attached to the shafts on each side. Boxes, bales of goods, or whatever else the load may be, are secured to the wheelbarrow by ropes. There are also seating accommodations on some wheelbarrows for four people, two on each side, and a cushioned seat is provided for the pas-

three miles, mornings and evenings, for the equivalent of about twenty-five cents per month. About 4,000 licenses are issued monthly to the same number of wheelbarrows plying for hire in the streets of the foreign settlements of Shanghai where, being under foreign regulations, they are the best in the Chinese empire. Sometimes as many as fifty wheelbarrows may be seen in the streets at a time. Very frequently the entire load is carried on one side of the barrow only, and it is extremely interesting to witness a Chinaman skillfully balancing and pro-



CARRYALL FITTED WITH MARTIN'S SPEED CHANGE GEAR.

senger, who usually sits with one limb resting on the front of the barrow, and the other hanging over the side in a rope loop which serves as a foot-rest. On the great Chinese plain, these machines are occasionally seen with a sail set, in which case a fair wind proves to be a great help to the trundling of a heavy load.

Since the introduction of cotton mills at Shanghai the wheelbarrow has been extensively used as a passenger vehicle, especially for carrying working women to and from the mills. One man will wheel six women for a distance of about

pellng it. The upsets and accidents, however, are remarkably few when it is considered that not less than 4,000 of these vehicles are in constant use, in addition to a large traffic otherwise.



MARTIN'S SPEED CHANGE IN USE

The annexed illustration shows a carryall recently completed by A. J. Martin of Buffalo and which was built to demonstrate the practicability of the Martin speed change gear. This device was recently patented and was described in Motor Age at the time of the patent issuance.

The wagon weighs 2,700 pounds and has carried as many as twenty-five men and boys. Mr. Martin reports that his speed change, which provides unlimited variable speed from a dead stop to the highest speed obtainable from the motors and which develops power in exchange for decreasing speed and vice versa, has shown itself as applied to the experimental vehicle to be well adapted to its purpose.

HOW ABOUT IT?

A reader of Motor Age asks this question: "Why do not builders of gasoline motors in this country utilize a part of the exhaust to heat the carburetor to prevent it from freezing up in cold weather and thus avoid the use of 84 gasoline, which is so very volatile, expensive and explosive?"

The plan is adopted by some of the French builders. Motor Age will be glad to receive and print contributions and expressions of opinion upon the subject, which is an interesting one.

EXPLOSION OF GASES

The following facts and data concerning the explosion of gases, etc., by instantaneous combustion as in gasoline motor cylinders is taken from an English cycle paper:

Explosion is an instantaneous ignition of a mass, and that mass may be solid or gaseous; thus, a mixture of charcoal, sulphur and niter in certain proportions, and prepared in a peculiar manner, form gunpowder which ignites instantaneously, and the increased volume, occasioned by the solid assuming the gaseous state, is the cause of the force, or power, attending the combustion.

There are numerous other solid compounds infinitely more explosive than gunpowder, but the simple mention of this will be sufficient as example.

Certain gases, like those from the solids mentioned, when intermixed in due proportion, are likewise capable of instantaneous combustion. For instance, hydrogen, when intermixed with oxygen, as before stated, in the proportion, by volume, of two of the former and one of the latter, ignites, producing an explo-

sion. Coal gas when combined with air in certain proportions is also explosive, due to the hydrogen and carbon composing it entering into combination with the oxygen of the atmosphere, producing water and carbonic acid gas; and the nearer they approach to the proper proportions for the perfect formation of these compounds, the greater is the force of the explosion.

A mixture of seven parts of air and one of gas is considered to be the most explosive compound, but this must depend upon the quality of the gas. The generally accepted theory is that mixtures of less than three of air to one of gas, or more than nine of air and one of gas, do not explode. Accidental explosions from gases are comparatively rare, the odor arising from gas is generally so repulsive as to awaken in the minds of the most callous a desire to avoid the annoyance, and in so doing the danger is averted.

An explosive compound of gas and air, when under pressure, only ignites at the exterior of the pipe; but if the pressure is taken off the flame enters and the explosion follows.

On one occasion, on making a trial with a very small holder, two feet of explosive compound, with a pressure of five-tenths the gas issuing from a one-fourth-inch orifice, ignited with a very intense blue flame, but on taking the pressure off the holder and applying a flame an explosion occurred.

An explosive mixture always possesses a very powerful odor of the contained gas, and this is sufficient to indicate to any one that a flame should not be approached. Considerable data can be written on gas explosions, causes, etc., the prevailing conditions being so numerous, and some contrary to others. However, to be safe, use caution, keep a pressure on the gas and oil and avoid a vacuum in the pipes, whereby the flame can be drawn in, and in almost any state is harmless.

CURRENT BREVITIES

J. A. Blaurock, largely interested in the International Automobile and Vehicle Tire Co., sailed for Europe on the *Luania* on Saturday to negotiate the sale

abroad of some valuable vehicle tire patents.

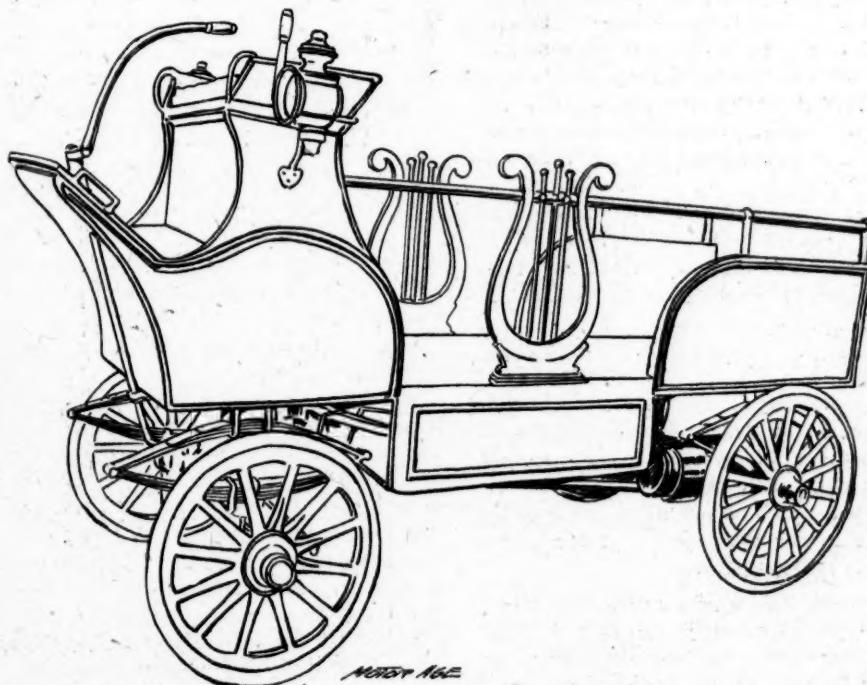
Woodbury (N. J.) firemen are raising money for the purpose of purchasing an automobile hose wagon.

It has recently been rumored that the officials of the South Side Elevated Railway Company in Chicago were preparing to establish lines of automobiles as feeders to the elevated service. Such a thing would doubtless turn a great amount of traffic from the surface cars to the elevated. It has been denied by the offi-

cials, however, that such a move is their immediate intention, the elevated railway men saying that while they consider the scheme a good one they are not yet satisfied with any of the automobile omnibuses now made.

People and papers have called the automobile by all sorts of long and short names and concocted all manner of abbreviations of the word automobile. The latest, shortest and nerviest is that employed by a heading writer on a Philadelphia daily. He does it thus: "O."

THE FIRST IN CLEVELAND



The above illustration shows the automobile piano delivery wagon recently introduced on the streets of Cleveland. It is driven by two motors, is capable of carrying three pianos at a time and will run twenty-five miles before the batteries need recharging. The maximum load it

is capable of bearing is 2,500 pounds. It is stated that it will run under fair load at ten miles per hour. Its owner, the B. Dreher's Sons Co., keeps it constantly busy with actual delivery work, and reports for it very efficient and economical service.

NOTES OF INTEREST

The mail service in Porto Rico is now equipped with an automobile.

Cleveland now has an automobile club. The new organization numbers about thirty members. Plans are being made to supplement the annual Decoration day bicycle road and track races with automobile competitions.

That the motor-propelled vehicle is beginning to attract the attention of tillers of the soil was made evident at a session of the Delaware County (Pa.) Farmers' Institute, held at Media recently, when an exhaustive paper on "Automobiles" was read by one of the members.

Alfred Harmsworth, owner of the London Daily Mail, who is among the enthusiastic automobilists in England starts from Calais Saturday in a new 12-horse power Panhard machine to make his yearly pilgrimage to the Riviera. The distance from Calais to Nice will be done entirely in his automobile.

A charter of incorporation under the laws of Virginia has been granted to the American Autocarette Co., of Washington, D. C. The object is to manufacture, buy and sell automobiles and other vehicles. The capital stock is \$300,000. O. G. Staples, a prominent business man of Washington, is president of the corporation.

An arch surmounted by a reproduction of the latest type of automobile is soon to be erected at the extremity of the Avenue de la Grand Armee in Paris to the memory of Lavassor. Lavassor did much to promote the interests of the automobile. This is doubtless the first instance of the introduction of the motor vehicle into sculpture.

The attempt of the Street Car Men's Union of Cleveland to introduce automobile omnibuses in competition with the street cars is apt to amount to a considerable enterprise in the near future. The first vehicle is nearly completed and the managers of the enterprise say that they will be able to add another every other week. The company has a working capital of \$25,000, which represents the savings of years of street car employes, as well as the promise of heavy backing if

the attempt to operate the omnibuses proves successful.

That time is money is proven by the fact that there are people who are willing to pay big prices for machines which can save time. A French automobile, which cost \$3,000, recently, according to report, sold for \$13,200, simply because it was more than usually speedy and could thus save enough time going from one place to another to win big motor vehicle contest prizes.

Protecting Strips.

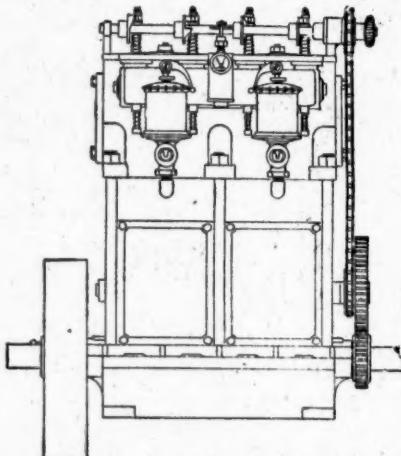
**Felted Rims
FOR
Pneumatic
Tires**



The annexed cut illustrates the application of a protecting strip on the edge of Rims, as a protection to the Pneumatic Tire, preventing the wearing or cutting of the outer edge of the Tire.

Price List and Particulars
on application to the

**Colonial Automobile
Co.** 32 Hawley St., BOSTON,
Mass.



This cut shows our four cylinder, 4½ horse power, non-vibrating, shifting spark, varying the speed from 100 to 1500 revolutions,

Gasolene Vehicle Motor

which we have demonstrated to be the most practical power in the market, occupying a space of 18 x 20 inches, manufactured upright or horizontal; weight, 175 pounds. We build from one to eight horse power. For vehicles, boats and light stationary work, we can prove superiority. Send for catalogue.

BUFFALO GASOLENE MOTOR CO.
Cor. Dewitt and Bradley Sts. **BUFFALO, N. Y.**